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<NOTICE>

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BILLING CODE 3510-DS-P

DEPARTMENT OF COMMERCE

International Trade Administration

University of Colorado Boulder, et al.

Notice of Consolidated Decision on Applications  
for Duty-Free Entry of Scientific Instruments

This is a decision pursuant to Section 6(c) of the Educational, Scientific, and Cultural Materials Importation Act of 1966 (Pub. L. 89-651, as amended by Pub. .106-36; 80 Stat. 897; 15 CFR part 301). Related records can be viewed between 8:30 A.M. and 5:00 P.M. in Room 3720, U.S. Department of Commerce, 14<sup>th</sup> and Constitution Ave, NW, Washington, D.C.

Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as each is intended to be used, that was being manufactured in the United States at the time of its order.

Docket Number: 12-053. Applicant: University of Colorado Boulder, Denver, CO 80203. Instrument: HF2LI Lock-In System. Manufacturer: Zurich Instruments AG, Switzerland. Intended Use: See notice at 77 FR 74647, December 17, 2012. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to measure detected near-field signals scattered off an Atomic Force Microscope (AFM) tip in a scattering-Scanning Near-field Optical Microscope (s-SNOM). The instrument will detect the magnitude and phase of the light scattered by an AFM tip to measure the electromagnetic near-field of optical antennas, plasmonics in metals and semiconductors (including graphene), photonic crystals, and other nanoscale spectroscopy applications. The instrument has the ability to fully digitize the measured signal and analyze it at 50 MHz, as well as the ability to demodulate many frequencies at once, which is essential to the measurement technique. Demodulation at 50 MHz is necessary because the AFM tip oscillates at 350-300 kHz, and higher harmonics (5<sup>th</sup> or 6<sup>th</sup>) of this oscillation

must be measured to isolate the near-field signal.

Docket Number: 12-054. Applicant: Purdue University, West Lafayette, IN 47909-2036. Instrument: DD Neutron Generator. Manufacturer: NSD Fusion, Germany. Intended Use: See notice at 77 FR 74647, December 17, 2012.

Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to determine the behavior of produced scintillation light and ionization electrons of low energy nuclear recoils of Xenon, as well as to compare the combination of energy released in these two channels to energy released in electronic recoils of the same energy. The scintillation and ionization signals are studied in a detector vessel that lies underneath 5 meters of water, thus the instrument needs to be water tight. To study the scintillation light and ionization behavior of liquid xenon to neutrons from a mono-energetic neutron source with energies close to 2.5 MeV, each neutron interaction must be resolved separately, and thus arrive at most once every

millisecond. The instrument has been proven to show less than a few hundred counts per second when operated at low voltage, and thus meets this requirement.

Docket Number: 12-057. Applicant: Massachusetts Institute of Technology, Cambridge, MA 02139. Instrument: Fast Ferrite Tuner. Manufacturer: AFT Microwave GmbH, Germany. Intended Use: See notice at 77 FR 74647, December 17, 2012. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument is part of a magnetic field-aligned Ion Cyclotron RF antenna, which is used to automatically follow the load variation in real time and make the antenna system load tolerant. The instrument's unique specifications are its frequency range of 50-80 MHz and 5 MW circulating power.

Docket Number: 12-058. Applicant: Regents of the University of California, Lawrence Berkeley National Laboratory, Berkeley, CA 94720. Instrument: Neodymium Iron Boron (NdFeB) Magnetic Block-HXU Model (Vacodym 776). Manufacturer: Vacuumschmelze GmbH & Co., KG, Germany.

Intended Use: See notice at 77 FR 76456, December 28, 2012.

Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to study matter on the fundamental atomic length scale and the associated ultrafast time scales of atomic motion and electronic transformation. The NdFeB magnet blocks must be of high magnetic field density to achieve the base spectral range. They must also be of high uniformity in order to achieve Free-Electron Laser (FEL) saturation. In addition to meeting these requirements, the unique capabilities of this instrument are expanded spectral reach, x-ray beams with controllable polarization, and "pump" pulses over a vastly extended range of photon energies to a sample, which are synchronized to the Linac Coherent Light Source II project's ray probe pulses with controllable inter-pulse time delay.

Docket Number: 12-063. Applicant: University of Pittsburgh, Pittsburgh, PA 15260. Instrument: Dilution Refrigerator with 9/2/2T Vector Superconducting Magnet.

Manufacturer: Leiden Cryogenics, the Netherlands. Intended

Use: See notice at 77 FR 76456-57, December 28, 2012.

Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used, in conjunction with the instrument imported under docket 12-065, to develop ways for preserving quantum information in a way that is immune to a wide variety of decoherence mechanisms, to program fundamental couplings at near-atomic scales, for the quantum simulation of "metasuperconductors," and to develop new mechanisms for the transfer of quantum information between long-lived localized states and delocalized states. The samples to be studied are a thin layer of  $\text{LaAlO}_3$  (LAO), grown on  $\text{SrTiO}_3$ , which undergoes a metal to insulator transition when the LAO thickness is greater than 3 unit cells. The unique features of this instrument are the ability to cool samples to  $T < 50$  mK using cryogen-free cooling where possible, an integral cryogen-free 3 axis vector magnet ( $> 5/1/1$  T), an integral large field magnet ( $> 18$  T), the ability to rotate the orientation in a large field, and scanning probe microscopy

capability at base temperature ( $T < 50\text{mK}$ ). These features enable the sample to be cooled below the superconducting transition temperature ( $T_c \sim 200\text{mK}$ ), to be rotated in any orientation relative to the magnetic fields, allow the investigation of the large spin-orbit field present in the samples ( $B_{so} \sim 15\text{T}$ ), and on nanometer size scales gate, modify and probe nanowire devices and quantum dot arrays.

Docket Number: 12-065. Applicant: University of Pittsburgh, Pittsburgh, PA 15260. Instrument: Motorized Two Axis Sample Rotator for Dilution Refrigerator.

Manufacturer: Attocube Systems, Germany. Intended Use: See notice at 77 FR 76456-57, December 28, 2012.

Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used, in conjunction with the instrument imported under docket 12-063, to develop ways for preserving quantum information in a way that is immune to a wide variety of decoherence mechanisms, to program fundamental couplings at near-atomic scales, for the quantum simulation

of "metasuperconductors," and to develop new mechanisms for the transfer of quantum information between long-lived localized states and delocalized states. The samples to be studied are a thin layer of  $\text{LaAlO}_3$  (LAO), grown on  $\text{SrTiO}_3$ , which undergoes a metal to insulator transition when the LAO thickness is greater than 3 unit cells. The unique features of this instrument are the ability to cool samples to  $T < 50$  mK using cryogen-free cooling where possible, an integral cryogen-free 3 axis vector magnet ( $> 5/1/1$  T), an integral large field magnet ( $> 18$  T), the ability to rotate the orientation in a large field, and scanning probe microscopy capability at base temperature ( $T < 50$  mK). These features enable the sample to be cooled below the superconducting transition temperature ( $T_c \sim 200$  mK), to be rotated in any orientation relative to the magnetic fields, allow the investigation of the large spin-orbit field present in the samples ( $B_{so} \sim 15$  T), and on nanometer size scales gate, modify and probe nanowire devices and quantum dot arrays.

Gregory W. Campbell  
Director  
Subsidies Enforcement Office  
Import Administration



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